ARIZONA DEPARTMENT OF HEALTH SERVICES

OFFICE OF CHRONIC DISEASE PREVENTION & NUTRITION SERVICES

LABORATORY PROCEDURE MANUAL

4th Edition
2004

Acknowledgments

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Chapter 1. Introduction

Purpose

The purpose of the Arizona Department of Health Services, Office of Chronic Disease Prevention & Nutrition Services Laboratory Procedure Manual is to provide guidance to local agency staff while performing hemoglobin tests used in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), the Commodity Supplemental Food Program (CSFP) and the Community Nutrition Programs. The manual is designed to be user-friendly.

Here is what you will find in the revised fourth edition:

Safety

The safety section includes basic instruction for personal protection and describes the OSHA requirements and the Industrial Commission's requirements to protect the worker from bloodborne pathogens.

Information About Blood Testing

This section includes information about the hemoglobin blood test and provides information to help you understand why the test is performed.

Note: Other publications will be affected by new information in this manual. It is the responsibility of the appropriate Office of Chronic Disease Prevention & Nutrition Services (OCDPNS)/Local Agency Nutrition Directors Team Leaders to make other publications conform to this manual.

Examples: State WIC Policy and Procedure Manual, OCDPNS Protocol, and Community Nutrition Program publications.

1998 CDC Cutoffs

The tables for cutoff values have been slightly revised, as there were data entry errors during AIM rollout. The tables include all altitude and smoking levels that are appropriate for Arizona.

2000 Blood Work Rule

WIC has coordinated its blood work rules with CDC and AAP standards. We accommodate referral blood work by allowing certifications to be based on other risks for up to 90 days so that clinics may incorporate test results performed at the doctor's offices, clinics and laboratories. The end result is to save WIC money by offering more coordination of services between programs, resulting in less trauma to participants, since low-risk participants would be tested less often.

Chapter 2. Safety

Universal Precautions

In 1991, the Occupational Safety and Health Administration (OSHA) published the Occupational Exposure to Bloodborne Pathogens Standard. The purpose of the standard is to minimize, if not eliminate, occupational exposure to bloodborne pathogens and, if followed, should keep you safe when you work in your lab area. The standard outlines necessary engineering and work practice controls, as well as requiring the availability and use of personal protective equipment (PPE).

One section of the standard deals with "Universal Precautions (UP)." This term is simply an approach or strategy designed to keep you safe when you work with blood or other bodily fluids. Under UP, the blood and certain bodily fluids of *all* individuals are considered potentially infectious. Standardized practices focus on treating every sample of blood as if it were disease-infected. Handle all human blood and certain human bodily fluids as if they were known to be infected with Human Immuno-deficiency Virus (HIV), Hepatitis B (HBV), Hepatitis C (HCV) or other bloodborne pathogens. Ask your supervisor if you have further questions.

These precautions are intended to prevent the transmission of infectious bodily fluids through parenteral routes such as mucous membranes and non-intact skin.

In 2001, the standard was revised to conform to the Needlestick Safety and Prevention Act. The act directed OSHA to revise the Bloodborne Pathogens (BBP) Standard in the areas of the Exposure Control Plan with new record-keeping requirements, employee input for work practice controls and modification of definitions of engineering controls.

Personal Work Practices

To comply with the OSHA standard, a written exposure control plan must be in place at each WIC clinic/site. The plan includes a copy of local policies and procedures for employee safety and a procedure for reporting accidents. Your manual should be kept close at hand and you should adhere to all of the practices as suggested in this manual. Each local agency will develop blood-borne pathogen information and training programs for all employees.

For your personal protection, follow these guidelines:

- Get a Hepatitis B vaccination.
- Do not allow or bring food, drinks or medication into technical work areas.
- Do not touch your face, apply makeup or handle contact lenses while in work areas where there is a reasonable likelihood of occupational exposure.

Personal Work Practices, continued

- Food and drink shall not be kept in refrigerators, freezers, shelves or on countertops where blood or other potentially infectious materials are present.

- The single most important means of preventing the spread of infection is handwashing. Wash your hands:
  - At the beginning and end of your shift,
  - Before a skin puncture and after removing your gloves,
  - After weighing unclothed infants,
  - After touching contaminated objects or using restroom facilities,
  - After making contact with your eyes, nose or mouth,
  - Before and after eating, drinking or handling food.

- Cover any break in the skin with a bandage.

- Wear disposable gloves when there is a possibility of contact with bloodborne pathogens.

- Use new gloves for every blood draw, even if participants are from the same family.

- Take advantage of all training offered by your employer. Your employer has considered the risks of contamination and established its own standards based on "reasonable risk."

Note: Your local agency may determine whether masks, eye protection devices such as goggles or glasses with solid side shields, or chin length face shields, should be worn.

Usually, protective devices for eyes, nose or mouth are worn whenever splashes, spray, splatter, or droplets of blood or other potentially infectious materials may be generated and contamination may be anticipated. It is generally accepted that the HemoCue® test for hemoglobin does not splatter or spray blood.

Warning!

If blood touches your skin or hair, wash the area with soap and water, and tell your supervisor immediately.

If blood splashes into your eyes, flush them with water. Contact a physician.

If you are accidentally stuck by a contaminated lancet, contact your supervisor. Arrange to see a licensed healthcare provider for a medical evaluation and counseling and to be tested for Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV).

Safety

Worksite Protection

- Recommended Lancet: Single-Use (needle is not able to be extended a second time) Capillary Blood Sampling Device, 2.25mm needle.

- Clean the work site at the beginning and end of each workday or after any contact with blood or other potentially infectious materials. Use a prepared bleach solution (see below) or an EPA-registered disinfectant that is effective as a tuberculocidal and kills Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV), in order to decontaminate contaminated work surfaces. Be sure to:
  1) wear clean gloves,
  2) completely remove all blood before applying the disinfectant,
  3) leave surface wet with the disinfectant for 30 seconds for HIV and 10 minutes for HBV,
  4) dispose of the infectious waste in accordance with federal, state, or local regulations (see page seven).

- EPA-registered tuberculocidal disinfectants and bleach solutions are appropriate for removing blood or other potentially infectious materials on surfaces and instruments. The Material Safety Data Sheet (MSDS) for commercial disinfectants must be posted in the clinic and all employees must be aware of its location.

Preparation & Storage of Bleach Solution

- Prepare a fresh bleach (5.25% sodium hypochlorite) solution weekly.

- To prepare a 10% bleach solution, mix 1 part household bleach with 9 parts tap water.

- Store at room temperature in an opaque plastic bottle labeled "10% Bleach." The date of preparation and the expiration date should be clearly marked on the outside.

Note: The expiration date is at the end of the seventh calendar day.

- Store out of the reach of children.

Disposal of Laboratory Waste & Supplies

- Discard all contaminated sharps, ie: retractable lancets & cuvettes, in special receptacles usually referred to as "sharps" containers. There are a variety of styles, and all are clearly marked with a biohazard symbol (see figure to the left). The container must be rigid, puncture-resistant, leak-proof, and disposable with a locking lid.

  Regardless of whether or not lancets contain safety features, such as retractable blades, all used lancets and other sharp objects must be disposed of immediately in a "sharps" container. When this container is filled to the acceptable level, it must be properly disposed of as biohazardous waste.

- Throw away other potentially infectious trash that is saturated with blood in a red, plastic biohazard bag. Find out from your supervisor how to handle biohazardous waste since it must be decontaminated before it can be disposed of in a landfill.

- All waste that is saturated and dripping with blood must be
  - Sterilized,
  - Incinerated, or
  - Chemically disinfected prior to mixing and disposing with ordinary waste.

- Waste, such as lint-free tissue, alcohol preps, gloves, bandages & wrappers, that contains blood but is not dripping, can be discarded in a regular trash bag if there are no means for biohazard waste disposal. Best Practice states it should be disposed of in a biohazard bag.

- Keep biohazard bag and all trash out of the reach of children.

Chapter 3. Information About Blood Testing

Type of Blood Test

There are many components of blood, and many tests are done for diagnostic purposes. The only blood test that will be addressed in this manual is hemoglobin.

Hemoglobin Testing

WIC staff conduct hemoglobin tests to screen and assess the participant's nutritional status. The test measures the amount of hemoglobin in the red blood cells. The hemoglobin test is performed because it is a quick screening tool for iron deficiency anemia.

Anemia

A low hemoglobin test result indicates the possibility of iron deficiency anemia. Anemia is a condition in which there are low levels of iron in the blood, with symptoms such as poor appetite, tiredness, weakness, developmental delays and learning problems present. It is the most prevalent risk factor of WIC participants. In the WIC program, a low hemoglobin level is most often treated with education and foods high in iron and Vitamin C. Referral for high-risk counseling and medical treatment may also be indicated. (Appendix B)

Anemia Cutoffs

Arizona uses the 1998 Centers for Disease Control and Prevention (CDC) Guidelines for anemia cutoffs (Appendix C). These cutoffs are also recommended by the Institute of Medicine as an acceptable reference. The cut-off values for anemia vary with altitude, age, sex, smoking status and stage of pregnancy.

Correct Values

You, as a health professional, have an important responsibility for correctly assessing values which may determine whether or not a person is eligible for the WIC Program. The values also determine the type of counseling and referral a participant receives.

Training

The Local Agency Director or her designee is responsible for ensuring the training, monitoring and supervision of the staff members who perform laboratory collection and analysis. Training must be adequate to meet the Clinical Laboratory Improvement Amendments (CLIA '88) regulations & follow the National Committee for Clinical Laboratory Standards (NCCLS) H4-A4 guidelines.

Information About Blood Testing

Authorization

Annually, the supervising physician or laboratory director (someone with specialized training in laboratory procedures) submits to the Arizona Department of Health Services (ADHS), Office of Chronic Disease Prevention & Nutrition Services (OCDPNS), a Letter of Authorization, which lists the individuals qualified to obtain and analyze laboratory samples as well as the dates when they were certified. The letter also needs to contain dates for which it is valid (ie: October 1, 20XX - September 30, 20XX). In addition, a CLIA "Certificate of Waived Testing" is required.

Work area

Select a work area for collection of the laboratory specimen.
An ideal work area:

- Is clean,
- Ensures client and staff safety,
- Has a surface which is smooth, free of cracks, and washable,
- Ensures patient privacy,
- Is away from noise and confusion, and
- Has a chair and table.

Hemoglobin measuring machines

The HemoCue® analyzer is a portable instrument with a sliding cuvette holder and display screen. It measures the amount of hemoglobin contained in a blood sample. The measurement takes up to 60 seconds and is expressed as grams per deciliter or g/dl. After reading the sample, the value will remain displayed on the screen for five minutes.

B-Hemoglobin system

- The **B-Hemoglobin** System comes with a small white box containing a quality control cuvette and an assigned value card. The same serial number should appear on both the machine and the control cuvette. Since the machine is factory-calibrated, the control is used daily to check the accuracy of the calibration.

Hb 201+

- The hand-held **Hb 201+** analyzer is the latest version of the B-Hemoglobin System. It does not require a quality control cuvette since the machine performs a self-test every time it is turned on.

Information About Blood Testing

Hemoglobin Measuring Machine

Daily care of the hemoglobin analyzer is explained in Chapter 4 of this manual. An operator's manual, as well as a troubleshooting guide and detailed cleaning instructions, are also found in this manual. (Appendices A & D)

The Hemocue® technical service telephone number is 1-800-426-7256.

Storage of Cuvettes

- Store cuvettes at room temperature. Do not expose to any direct heat source.
- Label the vial with the date on which it is opened. Record date on the Laboratory Client Log (see Appendix E for sample log).
- Label the vial with the date on which the contents of the vial expire (vial expires 90 days after opening). Note: an unopened vial of cuvettes has a two-year shelf life from the date of manufacture.
- Snap the vial cap closed each time a cuvette is removed. Never leave the cap partially open. The cuvettes are very sensitive to humidity and moisture. Remove one cuvette at a time for testing.

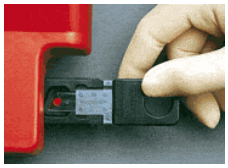
Chapter 4. How to Run a HemoCue® Control

Assemble Supplies

- Quality Control cuvette
- HemoCue® Machine
- Laboratory Client Log (Appendix E)
- Soap (antimicrobial only; check label) and water or alcohol-based hand cleanser or antiseptic hand wipes
- Gloves

Steps to Run A Control

Run a control cuvette at the beginning of each test day.



- Clean hands with antimicrobial soap and water or alcohol-based hand cleanser. Antiseptic hand cleanser, in conjunction with clean cloth/paper towels or antiseptic towelettes, are examples of acceptable alternatives to running water. (Acceptable products include GBG Aloe Gel from HealthLink, Purell, and Germ X Original.)
- Put on gloves.
- Wipe black cuvette holder with 10% bleach solution or approved disinfectant spray.
- Dry cuvette holder thoroughly before replacing in machine.
- Assure that the serial number on the control cuvette, the machine and the assigned value card are the same.
- Plug in the machine and turn the switch to the "ON" position.
- Wait until three dashes (---) start to blink on the display screen.
- Place the control cuvette into the cuvette holder and gently push in to stopping point.
- Compare the number that appears on the display to the assigned value on the card.

→If the number is within ± 0.3 g/dl of target value, record the displayed number on Laboratory Client Log (Appendix E). You are now ready to take participant blood samples.

If value is out of the control range, contact your supervisor or call the HemoCue® Company (1-800-426-7256). Do not take any blood samples until the problem is resolved.

Chapter 5. Daily Steps for Performing Hemoglobin Tests

Identify Client

- Assure that the consent boxes are checked and the client or authorized representative has signed and dated the consent/release form.
- Write the client's name, birth date, or other identifying information on the appropriate form(s).

Examples Laboratory Client Log (Appendix E)

Explain Procedure

Explain the procedure to the client or authorized representative in simple terms. Reassure them.

Example "I am going to make a little poke in your finger/heel to get a few drops of blood to put the blood into this little container. Then I am going to put it into this machine to find out how much iron it has in it." Be honest with him/her. If he/she asks if it may hurt, answer, "Yes, it may hurt a little."

Don't ever say, "No, it won't hurt."

Assemble Supplies

- HemoCue® machine
- Gloves
- Alcohol prep pads
- Sterile lancets
- Lint-free tissues or KimWipes®
- Closed vial of cuvettes
- Bandages (not for children under age 2)
- Sharps container
- Biohazard bag
- 10% bleach solution or disinfectant
- Antimicrobial soap and water, alcohol-based hand cleanser or hand wipes
- Laboratory Client Log

Daily Steps for Performing Hemoglobin Tests

Cleanse/Glove Hands

Wash hands with antimicrobial soap and water (or cleanse with an alcohol-based hand cleanser or hand wipes and put on gloves.

CHANGE GLOVES BETWEEN EVERY CLIENT!

Position Client

For infants under one year of age, a seated adult holds the infant over adult's shoulder or baby lies face-down across lap for heelstick.

NOTE: The heel site is recommended for infants less than one year of age to prevent possible bone or nerve damage in areas where there is less flesh.

For everyone else, seat client and extend arm with palm up.

♥ BE SURE THAT PUNCTURE SITE IS LOWER THAN THE HEART.

Choose Site

For infants, use either side of the plantar (bottom) surface of the heel when the baby is held over caregiver's shoulder. Never puncture the back curvature of the heel.

For everyone else, seat the participant or ask someone to help with a child. For instance, the caregiver may hold the child in his/her lap using both arms to keep the child still while you perform the procedure.

Have the client extend his/her arm with the hand lower than the heart and palm facing up. Use the middle or ring finger, but choose a finger that doesn't have a ring on it.

Warm the Site (if necessary)

The site should not be cold, blue, swollen or calloused.

If cold, warm the site by holding it in your hands, rubbing it for a minute, or by having the participant wash their hands vigorously with warm running water and soap or gently shake her hands.

Daily Steps for Performing Hemoglobin Tests

Cleanse the Site

Cleanse the site thoroughly with an alcohol pad.

Wipe site with a tissue or lint-free wipe. Be sure skin is *dry*.

Note: Pooled alcohol at the puncture site will dilute and hemolyze the blood, giving a lower reading, if skin surface is not dried completely.

Hold the Site

For infants, position the foot below the infant's heart. Encircle the heel by wrapping the index finger around the arch and the thumb around the bottom of the heel (see figure to the left). Grasp the heel or finger firmly between your thumb and index finger using your thumb in a gentle rocking movement.

For everyone else, lightly press the finger from the closest knuckle to the tip in a rolling motion to stimulate the flow of blood to the sampling point.

WHAT *NOT* TO DO:
Do not touch the prepared site after cleaning.

Do not "milk" the finger to speed the process. Squeezing or milking dilutes the blood and gives a false low reading.

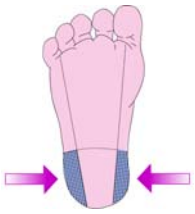
Daily Steps for Performing Hemoglobin Tests

IMPORTANT: If the lancet is blade-shaped, it should be placed perpendicularly to the whorls of the fingerprint/footprint so the blood is more easily collected into the cuvette.

Create a firm surface where you are going to puncture by pulling the skin taut or tight with your index finger near the first joint of the finger on the client's hand.

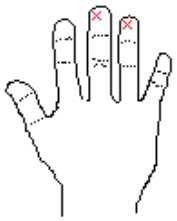
Puncture

For infants, when using the heel, puncture only on the medial or lateral side of the plantar (bottom) surface. See figure to the right.

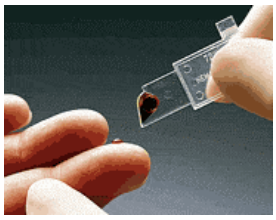


Do not puncture the foot if there are bruises, abrasions or sloughing skin present.

For everyone else, puncture the side of the fingerpad nearest the thumb in one continuous motion using a retractable lancet. This will allow for easy blood collection. Puncturing on the side of the fingerpad is recommended and will hurt less than on top of the fingerpad since there are less nerve endings.



Fill the Cuvette



- To ensure accuracy, you must wipe away the first two to three drops of blood. This will stimulate spontaneous blood flow, resulting in a better sample. If necessary, press gently again with thumb and forefinger until another drop of blood appears. Avoid "milking." **Do not touch the heel or finger at the site of puncture.**
  All drops should be large enough so they "sit" on top of the heel or finger like a bead.
- Ensure that the drop of blood is big enough to fill the entire cuvette, including the tip. Touch the tip of cuvette, pointing downward, into the middle of the blood drop so the cuvette touches the skin. Allow cuvette to fill in one step.
- The cuvette will fill itself automatically. Never "top off" the cuvette if it doesn't fill in the first swipe.

Daily Steps for Performing Hemoglobin Tests

Fill the Cuvette, continued

- Wipe excess blood off the flat outside surfaces of the cuvette. Keep it at a 45^{o} angle. Be careful not to touch the open-ended tip so that blood is not pulled back out of the cuvette.

  Example Using a gauze pad or lint-free wipe, "swipe" the cuvette as if you were sharpening a knife to remove any excess blood from the outside surfaces. Avoid the open "slit" of the cuvette with the gauze or wipe.

- If the cuvette does not fill completely on the first try, or if air bubbles are visible, discard the cuvette, wipe the puncture site and allow a new, larger bead of blood to form before collecting into the cuvette again.

Measuring Hemoglobin Value

Within 10 minutes of filling the cuvette, place it in its holder and gently push the holder into the machine with two fingers. The results will be displayed in approximately 60 seconds and will remain displayed for five minutes or until the slide arm is pulled out for removal of the cuvette.

Seal and Bandage Site

- Place dry gauze or lint-free tissue over the puncture site and apply gentle pressure until wound is clotted. Elevating the hand or foot above the level of the heart will help to stop the blood flow.
- Apply the bandage.

<u>Note</u>: Do not use bandages on the finger of a child less than two years of age to prevent potential ingestion and choking.

Daily Steps for Performing Hemoglobin Tests

When to Run a Second Test

Occasionally, a second test must be run, such as when the displayed hemoglobin value is outside the "Nutritionist" range (Appendix C). A second sample must be taken from a different site, preferably a finger on the other hand. The higher of the two hemoglobin values is entered into the AIM computer system and should also be used for referral purposes.

Example A 6.9 g/dl reading is obtained on an 18-mo-old. The second reading is 8.5 g/dl. Record 8.5 g/dl, counsel and write this higher value on the referral slip.

Cleanse Surface

If any blood spills on the HemoCue® machine, work surfaces or skin, clean with a 10% bleach solution or disinfectant spray immediately.

Disposal of Supplies

- Throw away any paper wrappers, alcohol preps, gauze, lint-free tissues, gloves and other supplies which are not saturated and dripping with blood in a wastebasket.
- Throw away any supplies that are saturated and dripping with blood in the red biohazard bag. If your gloves are contaminated with blood, turn the gloves inside out while taking them off and place in red bag with other supplies.
- Throw away all lancets and used cuvettes in the sharps container.

Remove Gloves

Remove and discard gloves after each client and after handling contaminated waste.

Clean hands with antimicrobial soap and water, alcohol-based hand cleanser or hand wipes if water is not available. Antiseptic hand cleanser, in conjunction with clean cloth/paper towels or antiseptic towelettes, are examples of acceptable alternatives to running water. However, when these types of alternatives are used, employees should wash their hands (or other affected areas) with antimicrobial soap and running water as soon as possible.

Daily Steps for Performing Hemoglobin Tests

Record Results

Record hemoglobin value as "g/dl" (grams/deciliter) on appropriate forms:

Examples Laboratory Client Log (Appendix E)
Medical screen in AIM

- If outside of “Nutritionist” range (Appendix C), follow State policy regarding referrals. Follow-up procedures will be determined by your local agency.

Factors Responsible for Poor Results

- Mechanical problems such as:
  - No control cuvette or incorrect control cuvette
  - Control cuvette not run on regular basis
  - Malfunctioning equipment
  - Machine not clean
  - Cuvettes past expiration date or left exposed to air
- Poor collection technique, such as:
  - Not thoroughly drying the site prior to puncture
  - Milking the site
  - Not wiping away the first two to three drops of blood
  - "Topping off" the cuvette with additional blood, resulting in air bubbles or layers in the cuvette
  - Not filling the cuvette entirely
  - Leaving the filled cuvette out of hemoglobin machine more than 10 minutes before measuring
- No quality assurance review performed by agency.

Chapter 6. Organizing a Laboratory Notebook

Policy

A laboratory notebook will be maintained at each clinic site and should include the following:

- Laboratory Client Log (Appendix E)
- HemoCue Blood Hemoglobin Photometer Operating Manual (Appendix A)

Note: A staff laboratory competency checklist must also be maintained, but may be kept with employee training records.

Laboratory Client Log

The Laboratory Client Log for hemoglobin test(s) performed must document the following:

- Quality Control test results,
- Name of the staff member performing the test,
- Date of testing,
- Equipment used (identify with serial #), and
- Client's names & their results.

Chapter 7. Staff Evaluation

Policy

All staff members performing blood tests will be trained in WIC University 101 through ADHS Office of Chronic Disease Prevention & Nutrition Services as a minimum requirement and authorized as competent before they perform any patient/client testing. They may also receive training at the local agency by the laboratory director or his/her designee.

All appropriate WIC staff will undergo mandatory training on capillary techniques and use of the HemoCue® instrument every two years, as arranged by the local WIC agency.

Additionally, all WIC staff referred to above will complete the ADHS Anemia CD-ROM module every two years and score at least 70% as a passing grade. Documentation of module completion will be maintained in the employee's training file.

This same staff must be continuously monitored to ensure proper implementation of the policies and procedures regarding blood collection, analysis, and quality assurance.

Procedure

For agencies that have local agency-provided training, the following procedure is suggested:

1. The laboratory director or designee will observe each staff member performing each step of collection procedures as outlined on the Staff Competency Check List, Appendix F.

2. The steps must be performed in an initial and follow-up practice session prior to clinical practice.

3. When a step has been completed correctly, the supervisor will place a check mark (√) in the appropriate box.

4. When a rating of 100% is obtained, the staff member is re-evaluated in two weeks. If a rating of 100% is not obtained, the staff member will be re-evaluated at one-week intervals until the 100% rating has been obtained.

5. Two consecutive ratings of 100% should be attained prior to authorization to perform patient/client testing.

6. All staff members authorized to perform blood testing should be monitored on the procedure quarterly.

Chapter 8. Glossary

Accuracy	the agreement of results with the true value for specimens measured.
Anemia	hemoglobin concentration (or hematocrit) below the 5th percentile of the distribution of hemoglobin or hematocrit of healthy, well-nourished individuals of the same sex, age and stage of pregnancy.
Biohazard Bag/container	a bag or container constructed of material of sufficient single thickness and strength to pass the 165-ram dropped dart impact resistant test as prescribed by STM D-1709-91 and certified by the bag manufacturer (usually red or orange and labeled "Biohazard".)
Calibration	a means to determine the accuracy of an instrument by comparing it with a known standard. The HemoCue® machine is factory-calibrated; the red control cuvette is used to check the accuracy of the calibration.
CLIA ('88)	Clinical Laboratory Improvement Amendment of 1988 – a public law governing the operation of clinical laboratories in the U.S. and mandating that all laboratories must be regulated using the same standards regardless of the location, type or size.
Cuvette	a small transparent container in which solutions are placed for photometric analysis.
EPA-registered Disinfectant	a cleanser that is recognized by the Environmental Protection Agency as being effective against tuberculosis-causing bacteria as well as HIV & HBV. It is used to decontaminate work surfaces.
Hemoglobin	the main component of red blood cells. It serves as a vehicle for transportation of oxygen to the tissues and carbon dioxide from the tissues to the lungs.
Hemolysis	the destruction of red blood cell membrane causing release of hemoglobin into surrounding serum or plasma.
Iron Deficiency Anemia	a reduction in the number of red blood cells resulting from iron depletion as evidenced by other laboratory testing.

Glossary

Lancet	a sharp metal needle or blade, often encased in plastic, that is used to puncture the skin in order to collect a blood sample. It is individually packaged to ensure sterility. OSHA requires it to be retractable or self-sheathing, disposable and used only once.
Rocking	a method used to increase blood circulation and flow to the skin puncture site by using a thumb or finger in a gentle rocking movement (lightly press the finger from the knuckle nearest the fingertip toward the end of the finger).
Sharps	a medical device or instrument such as a hypodermic needle, syringe, lancet, scalpel blade, cuvette, Pasteur pipette or broken glass that can cause a cut, puncture, or laceration.
Universal Precautions	a set of rules established by the CDC, and adopted by OSHA, to control infection from bodily fluids in the health care setting.
Standard Precautions	guidelines that apply to blood, all bodily fluids, non-intact skin and mucous membranes; replace Universal Precautions and are to be used for the care of all patients since everyone is assumed to be infected and, therefore, a possible contaminating factor.
Vial	a small container with a lid, used especially for storing liquids.

Chapter 9. Bibliography

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Appendices

Appendix A - HemoCue® Operating Manuals

Appendix B - Blood Work Requirements, Options and Referrals

Appendix B - Blood Work Requirements, Options and Referrals

Policy

7 CFR §246.7(e)(1) Determination of nutritional risk, and Nutrition Risk Sections of State Plan for Risk 201 for women, infants and children states that "At a minimum, . . a hematological test for anemia such as hemoglobin...shall be performed and/or documented at certification for applicants with no other nutritional risk present. For applicants with a qualifying nutritional risk factor present at certification, such test shall be performed and/or documented within ninety (90) days of the date of certification."

The Blood Work Rule effective January 18, 2000, states that liberalizing the timeframes of blood collection is based on WIC's track record of reducing anemia rates nationally and improving coordination of services. Arizona WIC recognizes that it has one of the highest rates of anemia nationally and has enthusiastically adopted parts of the blood work rule, which will reduce barriers to service without sacrificing data collection.

Special Note

Anemia (blood) screening is part of the WIC certification process (which may be obtained via referral) and is mandatory for participation. The only time blood testing may be waived is if there is a religious objection (i.e. Christian Scientist) or a medical reason (i.e. hemophilia) or if performing the test will cause physical harm to the participant and/or staff member. In this case, one (1) month of Food Instruments may be issued and the blood test will be attempted in one month at their next WIC visit. Thus, a person may not be certified without blood work data except when religious or medical reasons exist and this must be noted in their WIC record.

If blood work data is brought from an outside source within 90 days of certification, the actual date that the blood test was performed must be entered into AIM. Do not use the date that it is being entered into AIM.

Appendix B - Blood Work Requirements, Options and Referrals

Category	Age Blood Work Required	Certification Blood Work Required	Exceptions to Certification Blood Work Required
Pregnant women	**None**	**1 blood test taken during pregnancy**	**Prenatal women can be certified without blood work if:** • **at least one qualifying nutritional risk is present at certification and** • **blood test is obtained within 90 days of certification**
Postpartum women	**None**	**1 blood test taken 4-6 weeks after end of pregnancy**	**None**
Breastfeeding women	**None**	**For women 6-12 months postpartum, no blood test is required if 1 test was taken after end of pregnancy**	**For women 6-12 months postpartum, no blood test is required if 1 test was taken after end of pregnancy**
Infants <9 months	**None**	**None**	**None**
Infants 9 months or older	**Blood work required once between 9-12 months**	**Blood work required for infants certifying between 9-12 months**	**Blood work taken between 12-13 months can be used when no other blood work is available for infant category**
Children 12-24 months	**Blood work required once between 12-24 months (6 months after infant test)***	**Blood work required at initial certification** **All children are required to have blood work on an annual basis unless previous blood work result demonstrated nutritional risk eligibility for low Hgb. In this case, blood work is needed every 6 months.**	
Children 24-60 months	**None**		

***Blood work taken at or before the first birthday does not satisfy the requirement for both the infant blood work and the children's 12-24 month blood work. Separate blood work is required for each age range.**

Appendix B - Blood Work Requirements, Options and Referrals

Pregnant women

- Blood work must be collected during the pregnancy.
- Blood work is normally collected by WIC staff at the certification visit.
- Results from an outside source (i.e. doctor's office) are also acceptable if it was drawn during the pregnancy. If the results are not available at the Certification appointment, a note must be placed in the chart outlining the method and date by which the results will be reported. In the interim, the participant is placed on monthly pick-up, pending provision of blood work, for up to 60 days.
- Women who are certified presumptively (with Risk 503) need to have blood work done within 90 days of certification.
  They will be screened for all risks in 60 days, including anemia screening, if no other risk is found.

Postpartum & breastfeeding women

- Blood work must be collected during the postpartum period: preferably within four to six weeks (30 - 45 days) of the termination of the pregnancy. Blood work is not valid if drawn before four weeks (30 days) postpartum.
- The second blood test for breastfeeding women should be approximately six months postpartum. This second test is optional for women who had normal results from previous certification.
- Blood work is normally collected by WIC staff at each certification visit. Results from an outside source (i.e., doctor's office) are acceptable if drawn after four weeks postpartum and reported to WIC within 90 days of certification. This may be done only if another nutritional risk is present at the Certification appointment. The actual date that the blood test was performed must be entered into AIM. Do not use the date that it is being recorded.

Appendix B - Blood Work Requirements, Options and Referrals

Infants

Blood tests are not required for infants under nine months of age. Blood work should be collected:

- once between 9–12 months of age, and/or
- at the time of certification which begins after the infant has reached nine months of age.
- by WIC staff. Results from an outside source (i.e. doctor's office) are acceptable if drawn after nine months of age for a full-term infant, or after six months of age for a premature infant. A blood test before nine months of age may also be appropriate for low birthweight infants who are not fed iron-fortified formula.
- If the blood is drawn at 12 months of age, the cutoffs used should be reflective of a one-year-old child status.

Appendix B - Blood Work Requirements, Options, and Referrals

Children

- Blood work must be done on all children at least once every 12 months after the child is 18 months old. The exception is if the blood work data was within normal limits (WNL) at or within their last certification, in which case, there may be a period of 14 months between blood tests.

  Children are at highest risk for anemia between 9 and 18 months of age.

  Example: Blood work taken at 10 months of age may be used to certify a 12-month-old child. A blood test is required at the 15-18 month certification for all children.

  Example: A child's results were within normal limits (WNL) during the certification periods beginning at 12 months and 18 months. The test is optional at the 24-month certification.

  Children 2-5 years old with low hemoglobin must have a blood test at six-month intervals.

- Blood work is normally collected by WIC staff at the Certification visit. Results from an outside source (i.e. doctor's office) are acceptable if drawn within 90 days of the certification date. The actual date that the blood test was performed must be entered into AIM. Do not use the date that it is being recorded.

- If no risk can be found at a certification, a blood test should be performed before ruling that the child is ineligible, even if the child's last result was normal.

  Exception: If the authorized representative waives the right to the blood test after having the consequences explained to them, the child is then ruled ineligible.

Appendix B - Blood Work Requirements, Options, and Referrals

- If the local agency has closed priorities, a blood test is recommended before placing a child on the waiting list.

- Certification of a child who is new to the program will include a blood test, regardless of the age of the child.

  Exception: The certification of a child who is an out-of-state transfer will not require a blood test. Instead, a hemoglobin value from the child's most recent certification that is within normal limits can be found on the Verification of Certification (VOC).

Recommended Procedures

For hemoglobin results below the "Anemia" cutoff value:
The Community Nutrition Worker (CNW) will educate the participant or caregiver that WIC screens for (not diagnoses) anemia and counsels the participant on appropriate strategies to increase their iron levels.

For hemoglobin results outside the "Nutritionist" range:
If a client's hemoglobin value is outside the "Nutritionist" range for the first time, perform the procedure again. If possible, have a different person run the test on a finger from the participant's other hand. Record the lower of the two values in the AIM system.
Educate the participant or caregiver that WIC screens for (not diagnoses) anemia and since their value is outside of WIC's normal range, we are going to refer them to the nutritionist for further evaluation.

If the hemoglobin value remains outside of the "Nutritionist" range at their subsequent Certification, the CNW will automatically refer them to their healthcare provider. This should be documented in the Referral section of the Care Plan screen in the AIM system.

Note: Poor technique often results in an abnormally low value.

Appendix C – CDC Cutoffs for Anemia

Appendix D - Laboratory Client Log

Appendix D - Laboratory Client Log

Clinic_____ HemoCue® Serial No. _____

Staff _____ Acceptable range for control cuvette_____

Date_____

Client Name	**DOB**	**Hgb (g/dl)***	**Retake value****	**Referral**	**Staff Initials**
Example: Antonio Ramirez	12/01/01	9.0	N/A	RD	ABC

* Hemoglobin values at or below "Anemia" cutoff are reported as anemic in WIC.

** If hemoglobin value is outside the "Nutritionist" range, repeat the procedure. Have a different person run a test on a finger from participant's other hand, if possible, and enter both values in this log. Record the higher of the two values in AIM. This value should also be used for referral purposes.

Appendix E - Staff Competency Check List

Appendix E - Staff Competency Check List

Staff Name:_____

Supervisor:_____

Completed = √
Not met = ⃠
Grade = # of √ ÷ 16 x 100 =___%

PROCEDURE	#1	#2	#3	COMMENTS
1. Identify client				
2. Assemble supplies				
3. Cleanse & glove hands				
4. Position client & choose site				
5. Warm site (if necessary)				
6. Cleanse puncture site and allow to dry				
7. Hold site firmly & pull skin taut				
8. Puncture skin (correct site and depth)				
9. Wipe off first 2-3 drops (no milking)				
10. Cuvette tip pointed down, filled in one step (no bubbles or layers)				
11. Apply pressure & bandage (if appropriate)				
12. Wipe excess blood from outside of cuvette				
13. Correctly dispose of used supplies				
14. Remove & dispose of gloves, cleanse hands				
15. Record results				
16. Clean surface				

Scores = ___ ___ ___ → Avg. Score ___

Staff Signature_____Date:_____

Supervisor Signature_____Date:_____